GUIDELINE D.05 – Public Safety Radio System Coverage

D.05.1 PURPOSE

The purpose of this guideline is to provide information and minimum requirements to ensure effective radio coverage throughout the City of Newport Beach for the Countywide Coordinated Communication System utilized by police and fire personnel for public safety services.

D.05.2 SCOPE

This guideline shall apply to the following buildings and structures:

- Any building or structure which has more than 3 stories above the grade plane.
- Any building or structure, regardless of the number of stories, in which any single floor space exceeds 45,000 square feet.
- Any building or structure containing a subterranean space of 250 square feet or more. For buildings and structures three stories or less above grade plane, or less than 45,000 square feet on any single floor, only the subterranean space shall comply.
- Any building or structure deemed likely to have diminished in-building communications due to the use of certain construction materials, window coatings, shape, location or other factors as determined by the fire code official.

  Exceptions:

  1. One and two family dwellings.
  2. A building or structure which supports adequate radio coverage for City emergency service workers operating on the 800 MHz Countywide Coordinated Communications System as described in the RCSC without the need for a bi-directional amplification system.

3. A reconstructed building or structure in which less than 50% of the interior and/or exterior vertical structural or non-structural elements measured by wall surface area are uncovered during a contiguous 24 month period.

D.05.3 DEFINITIONS

Bi-directional amplifier (BDA) shall mean a specialized radio frequency amplifier that, in conjunction with signal boosters, a radiating cable system and/ or a distributed antenna system, receives specific public safety radio frequency signals from an antenna and amplifies and retransmits the signals.

City of Newport Beach Public Safety Radio System Coverage Standards (RSCS) shall mean those standards officially adopted and published by the Newport Beach Fire Chief to provide optimum coverage and radio effectiveness within buildings and structures under the Countywide Coordinated Communication System.

Countywide Coordinated Communication System (CCCS) shall mean that radio system used by local law enforcement, fire, lifeguard, and public works departments within the County of Orange for emergency and non-emergency radio communication on the 800 MHz radio band.

FCC-certified technician shall mean an individual who is qualified with a General Radiotelephone Operator License (GROL/PG), or equivalent, to review design plans and perform tests in affected structures to measure RSCS.

NBFD shall mean the Newport Beach Fire Department.

NBPD shall mean the Newport Beach Police Department.

OCSD/Communications shall mean the Orange County Sheriff-Coroner Department/Communications Division.

Reconstruction. For purposes of this guideline the word "reconstruction" shall mean remodel, renovation or alterations to a building or structure in which 50% or more of the interior and/or exterior vertical structural or non-structural elements measured by wall surface area are uncovered during a contiguous 24 month period.

Special Inspector shall mean an FCC-certified technician approved by the City of Newport Beach.

For the purposes of this guideline, **Delivered Audio Quality** is defined below:

Delivered Audio Quality **(DAQ)**	**Subjective Performance Description**
1	Unusable, speech present but unreadable.
2	Understandable with considerable effort. Frequent repetition due to noise / distortion.
3	Speech understandable with slight effort. Occasional repetition required due to noise / distortion.
3.5	Speech understandable with repetition only rarely required. Some noise / distortion.
4	Speech easily understood. Occasional noise / distortion.
4.5	Speech easily understood. Infrequent noise / distortion.
5	Speech easily understood.

D.05.4 PERMITS REQUIRED

Permits and Plans:

A Building Department permit is required to install, repair or modify any Public Safety Radio System Coverage component that may be required in this guideline. All permits are required prior to starting any work.

D.05.5 PROCEDURE

New and Reconstructed Buildings:

All buildings and structures required to comply with this guideline shall, at the time of construction or reconstruction, have a two-inch metallic conduit installed between the

ceiling of the lowest subterranean level and the roof of the building or structure. At each level or floor and the roof, an opening shall be made to afford easy access to the conduit from the above ceiling area. Access in the form of either drop ceilings or conduit shall be made available along hallways and through firewalls. All qualifying subterranean spaces shall have similar conduit installations.

***Note:** Prior to occupancy of the building or structure the entire area of the building or structure shall be tested by an approved FCC certified technician. If the building or structure is found to "naturally" meet the City of Newport Beach public safety radio system coverage and specifications found in this guideline, no further action is necessary.

Performance:

Specifications are provided to assist property owners in satisfying a delivered audio quality (DAQ) of 3 for emergency personnel using radio communication in their buildings and structures. Property owners who adhere to all of the specifications and fail to reach the reliability factor must employ all resources necessary to ensure full compliance. Performance and compliance shall be inspected annually by the City of Newport Beach Fire Department or their appointed agent.

- General Building Area Coverage:

  At a minimum, 90% of the general floor area shall be provided with DAQ 3 radio coverage.

- Critical Area Coverage:

  Critical areas, as determined by the fire code official, shall be provided with DAQ 3 radio coverage over 99% floor area. Critical areas shall include, but not be limited to, fire control rooms, fire pump rooms, exit stairs, exit passageways and fire sprinkler sectional and general control valves.

Specifications:

The following defines the minimum required level of radio signal strength:

- Minimum signal strength into the building: A minimum signal strength of -95dBm shall be received in 90% of the general building area and 99% of the critical area of each floor of the building or structure from the agency's radio system.

- Minimum signal strength out of the building. Minimum signal strength of -100 dBm shall be received by the agency's radio system when transmitted from 90% of the general building area and 99% critical area of each floor of the building or structure.

- The frequency range supported ***from*** the 800 MHz Countywide Communications System shall be 851 – 869 MHz (base transmit frequencies).

- The frequency range supported ***to*** the 800 MHz Countywide Communications System shall be 806 – 824 MHz (radio field transmit frequencies).

- A public safety radio amplification system shall include filters to reject frequencies below 851 MHz and frequencies above 869 MHz by a minimum of 35 db.

- All system components must be 100% compatible with analog and digital modulations after installation without additional adjustments or modifications. The systems must be capable of encompassing the frequencies stated herein and capable of future modifications to a frequency range subsequently established by the City of Newport Beach Fire Department. If the system is not capable of modification to future frequencies, then a new system will need to be installed to accommodate the new frequency band.

- Active devices shall have a minimum of -50 db 3rd order intermodulation protection.

- All active in-building coverage devices shall be FCC part 90 Type Certified.

- UL listing is required for any AC operated power supplies.

- Active devices shall include a minimum of 12 hours of battery backup power.

- Any in-building coverage system shall be installed by a Newport Beach Fire Department approved, manufacturer-trained and certified installer.

Remedies to achieve compliance (Acceptable Amplification Systems):

If the building or structure is unable to naturally achieve compliance with the required reliability factor, the property owner must install each of the following:

1. An in-building coverage system consisting of a UL listed radiating cable system and/or a distributed antenna system (DAS) with FCC-certified bi-directional 800 MHz amplifier(s), and subcomponents.

2. Multi-band pass filters as required.

    - All active devices (e.g. signal booster) must be encased in a NEMA 4 (or equivalent) dust/waterproof case and clearly labeled “City of Newport Beach Public Safety Radio”.

    - The battery and battery charger must be encased separate from all other electronic components of the system and shall be housed in a NEMA3R (or equivalent) vented enclosure.

    - All electrical components must be equipped with independent auxiliary battery power or generators to function at full capacity for at least twelve (12) hours.

Applicable Federal Communications Commission Rule Compliance. ll active devices used to provide extended coverage must be FCC-certificated.

Design Review and Certification:

Prior to issuance of a building permit, the applicant shall:

- Retain a Newport Beach Fire Department approved FCC-certified technician who will review construction plans in order to ensure that such plans meet the aforementioned radio communication criteria, including the location of all necessary conduit

- Submit copies of plans certified with the signature of the technician to the Newport Beach Building Department.

Prior to issuance of a Certificate of Occupancy, the applicant shall:

- Retain a Newport Beach fire department approved FCC-certified technician who will test all areas of the building or structure, verify installation and operation of in-building solutions, if needed, and certify all of the findings stated herein on the date of inspection with his/her signature. A passing test is one that demonstrates DAQ 3 with a 90% reliability factor on each floor and 99% reliability factor within all critical areas. Owners of buildings or structures that fail to meet this standard will not be in compliance with this ordinance.

Test Standards

Initial Test Procedure:

- For purposes of testing, each floor of the building shall be divided into a grid of approximately twenty (20) equal areas. A maximum of two (2) nonadjacent areas will be permitted to fail the test. In the event that three (3) of the areas fail the test, and to provide greater statistical accuracy, the floor may be divided into forty (40) equal areas. In such an event, a maximum of four (4) nonadjacent areas will be permitted to fail the test. The test shall be conducted by using a Motorola XTS 3000/XTS 5000 or equivalent portable radio talking through the 800 MHz Countywide Coordinated Communications System. A spot located approximately in the center of a grid area will be selected for the test. The radio will then be keyed to verify two-way communication to and from the outside of the building through the 800 MHz Countywide Communications System. Once the spot has been selected, prospecting for a better spot within the grid area will not be permitted.

- All auxiliary power systems shall be tested under load for a period of one (1) hour to verify that the system will operate properly in the event of a power outage. The testing technician reserves the discretion to determine whether or not the battery exhibits symptoms of failure. The FCC-certified technician will ultimately decide if the auxiliary system needs to be replaced or upgraded.

Annual Test Procedure:

- After a Certificate of Occupancy is issued, the annual tests will be conducted by Newport Beach Fire Department personnel, or their agent in accordance with the test standards as listed in the City of Newport Beach Public Safety Radio System Coverage Guidelines. If communications appear to have degraded or if the tests fail to demonstrate adequate system performance, the owner of the building or structure is required to remedy the problem and restore the system in a manner

consistent with the original approved criteria. Failure to remedy any problems shall render the building and/or any appendages unsafe. Testing and re-testing will be performed at no expense to the City or the appropriate emergency services departments.

Additional Equipment Feature Requirements

Active devices shall be alarmed. A phone line (plain old telephone service or POTS) will provide dial tone to an alarm device. The alarm device will be programmed to activate a pager on the County of Orange's 900 MHz paging system. Access to the active components of the in-building coverage system (if any) is required twenty-four (24) hours a day by County technicians/engineers. The minimum alarms will indicate loss of A/C current failure and operational failure. The device shall also have modem access to allow remote monitoring.

Existing Buildings Equipped With Hardwire Firefighter Phone Systems

In existing high rise buildings equipped with hardwired firefighter communication systems, the hardwired system may be removed when the building is determined to be in compliance with this section and approved by the fire code official.

Responsibility and Cost

The building owner must retain all records of initial and annual inspections and submit copies to the Newport Beach Fire Department.
The owner of any building or structure to which this guideline applies shall be responsible for all costs associated with compliance with the City of Newport Beach Public Safety Radio System Coverage specifications and guidelines.

CERTIFICATION – PUBLIC RADIO SYSTEM COVERAGE

BUILDING PERMIT NO: _____ CERTIFICATION TESTING DATE: _____

BUILDING ADDRESS: _____

FCC-Certified Technician to provide checkmark for one of the following:

___(Amplification System Provided) I certify that installation of the necessary amplification system and its associated components have been installed per plans and specifications. (Note: amplification system requires OCCOMM clearance, see bottom of page)

___(Amplification System Not Required) I certify that installation of the 2 inch conduit or greater pathway, from the lowest floor to the roof, has been installed per plans and specifications.

I further certify that radio coverage testing has been conducted and radio coverage has been found to meet the minimum requirements of the City of Newport Beach Guideline D.05 for check one) ___ *Both DAQ and Signal Strength* ____ *DAQ only*

_____ _____
(FCC Certified Technician Name) (Signature)

_____ _____
(FCC License Number) (Phone Number)

_____ _____
(Technician's Company Name) (Date)

___ OCCOMM Clearance Non-interference check and alarm programming verification. (Only required when amplification system provided)

___ Received: One copy of As-built plans per City of Newport Beach Public Radio System Coverage Testing and Acceptance Procedure (or copy of original approved plans if design was not deferred).

_____ _____
(OCCOMM Representative Name) (Signature)

(INTERNAL USE: Inspector to check the appropriate lines and collect testing report and as-builts as needed; permit specialist to update permit record, file form, testing report, and as-builts for records retention)

Testing Report Received ___
Deferred Decision: ___ Amplification System provided, set of as-builts collected. (800.1)
___ Amplification System not required. (800.2)